until the second, and the problem of the relations of substance to substance, about which we still know very little, is relegated to the third and last division.

The first part, or chemical dynamics, which is now available in German and in French, treats the subject under the two general heads of *Chemical Equilibrium* and *Reaction Velocity*. We have the physical and chemical equilibria in a homogeneous substance, between two substances, between three substances, between four substances; chemical equilibrium from the molecular-mechanical standpoint; homogeneous and heterogeneous equilibra; the law of reaction velocity; reaction velocity and equilibrium; reaction velocity and affinity; mono-, bi- and tri-molecular reactions; effect of the surroundings and medium on reaction velocity; effect of temperature on the reaction velocity; effect of pressure on the reaction velocity.

The translation of this, a part of Van't Hoff's work, before the appearance of the remainder, is indicative of that esteem in which he is so justly held, not only at home, but in foreign lands. The translation into French seems to have been very carefully done, and the French edition is an inviting one, barring an occasional typographical error.

It is a matter of delight to all who are interested in physical chemistry that books are appearing simultaneously on the same chapter of their subject, from the pens of two of the great leaders in this field of work. As is well known, that portion of Ostwald's Lehrbuch which deals with the broad subject of *Verwandtschaftslehre* is now available in part. These two works admirably illustrate the difference in method of these two master minds, and each is enhanced in value by the other.

HARRY C. JONES.

Laboratory Directions for Beginners in Bacteriology. By VERANUS A. MOORE.

This book of ninety pages contains the outlines of an introductory laboratory course divided into sixty lessons, and aims to impart a technical and working knowledge of the more essential bacteriological methods and to develop a definite knowledge of a few important species of bacteria. The book is not intended to replace the text-book on bacteriology, but to be a manual for use at the laboratory desk in which through a series of carefully selected exercises the student, without waste of time, will cover the necessary ground.

A manual such as this represents strongly in its selections and in the amount of time alotted to each subject the personal opinions of its author, yet we believe on the whole the judgment of the writer will be approved by teachers.

This book will be found very useful by teachers who have not the time to prepare and print their own outlines. Even those who are compelled to give a course much shorter than that sketched in this book can easily, without serious harm, reduce the length of the course by omitting the practical work in some of the chapters and shortening it in others. The classification of the bacteria upon the system of Migula seems to us a mistake, for it necessitates many changes in the accustomed nomenclature; thus the name bacillus is limited to motile rod-shaped organisms to which the flagella are attached to all parts of the body. A bacillus with polar flagella becomes a pseudo-monas and one without any flagella a bacterium. As this book is intended to be used along with various text-books on bacteriology, it would seem wiser to have omitted any elaborate and unusual classification which, however valuable, must of necessity frequently clash with that used in the text-book, and thus tend to confuse the student.

WM. H. PARK.

GENERAL.

THE U. S. Department of Agriculture has issued a bulletin on Fish as Food (*Farmers' Bulletin*, No. 85), by Dr. C. F. Langworthy, of the Office of Experiment Stations, in which the results of investigations on the nutritive value of various kinds of sea food have been summed up for the general reader. The chemical composition of a considerable number of fresh and preserved fishes, mollusks, crustaceans, etc., are given; the relative cost of protein and energy in fish and other food material is shown; the place of fish in the diet is discussed, and some sample menus are given to show how fish may be combined with other food materials to make a well-balanced dietary. The popular notion

that fish is a 'brain food' is combatted, but it is stated that 'most physiologists regard fish as a particularly desirable food for persons of sedentary habits.'

THE second and third volumes of Jordan and Evermann's 'Synopsis of the Fishes of North and Middle America' have appeared, but the volume of illustrations, it is understood, may be delayed for some months. When the last volume is published, a review may be expected in SCIENCE.

THE new 'Life of Michael Faraday,' by Professor Silvanus Thompson, which Messrs. Cassell & Co. will publish shortly, contains, says *Literature*, many points that have not appeared in any earlier biography. Several hitherto unpublished letters and a poem by Faraday himself are included, as well as a number of extracts from his laboratory note-books, from which also some sketches of apparatus are reproduced in facsimile. Fresh light is thrown upon Faraday's refusal, in 1836, of the pension offered him by Lord Melbourne.

SCIENTIFIC JOURNALS.

THE *American Naturalist* for December opens with an article by Mr. L. P. Gratacap of the American Museum of Natural History on the Relations of James Hall to American Geology and a portrait of Dr. Hall is given as a frontispiece. The work on the Wings of Insects by Professor Comstock and Dr. Needham is continued. Professor J. L. Howe contributes an interesting article on variation in the shell of *Helix Nemoralis* in the Lexington (Virginia) colony. Mr. H. H. Field describes the work of the *Concilium Bibliographicum*. He states that it has been conducted at a considerable loss, but that its future is now assured by the subsidy voted to it by the Swiss Confederation, the Canton and the town of Zurich. It is said that, while South America and Hawaii have ordered several complete sets of the cards, there is only one such set in New England. The last article of the number is by Mr. O. P. Hay on 'Protostega, the systematic position of Dermochelys, and the morphogeny of the Chelonian Carapace and Plastron.' We regret to see that Dr. Robert P. Bigelow feels compelled to resign his position as editor-in-chief of the *Naturalist*, as he is unable to devote to it the large amount of time required for its management.

THE *American Geologist*, for December, contains the following articles: 'On the Dikes in the Vicinity of Portland, Maine,' E. C. E. Lord; 'Thomsonite and Lintonite from the North Shore of Lake Superior,' N. H. Winchell; 'Primitive Man in the Somme Valley,' Warren Upham; 'The Great Terrace of the Columbia and other Topographic Features in the Neighborhood of Lake Chelan, Washington,' Israel C. Russell; 'The Occurrence of Cretaceous Fossils in the Eocene of Maryland,' Rufus Mather Bagg, Jr.

THE *Biologische Centralblatt* issued on October 27, 1898, contains a memorial notice of the late Professor Theodore Eimer by his former assistant, Gräfin Dr. Maria von Linden. It may be remembered that Dr. von Linden contributed to this JOURNAL (Vol. IV., p. 308) an account of Eimer's work in certain directions.

WE have received the first number of the *L'Intermédiare des neurologistes et des aliénistes*, edited by the competent neurologist, M. Paul Sollier, and published by M. Felix Alcan, Paris. A most curious feature of the journal is the publication of its contents in French, German and English versions, a plan that would scarcely occur to a German or an Englishman. It is no wonder that under these conditions the editor asks that, considering the space required by 'the threefold texte,' correspondents are requested to write 'in the most possible short manner.' It would, we feel sure, be interesting to quote in full the editorial introduction, but we have only space for the concluding sentences: "The interest of informations taken and given, the pleasure of exposing personal opinions on subjects of high importance with the hope of being useful to others equally interested to them will, I hope, be sufficient movus to permit us to expect a collaboration which will find us very grateful. It will depend of them to whom we address that this organ, modest at its beginnings, should take, in the course of time, more and more importance and more extent, and we pray for some credit before any judgment."